

***This listing of claims will replace all prior versions and listings of claims in the application:***

**Listing of Claims:**

Claim 1 (currently amended): A method of using ionic liquids ~~such as molten salts~~ as solvents in headspace gas chromatography wherein said method comprises dissolving or dispersing a sample in at least one ionic liquid, wherein the ionic liquid is a molten salt and volatilizing the volatile components of the sample.

Claim 2 (currently amended): The method according to claim ~~[[3]]~~ 1 wherein the ionic liquid has a melting point of less than 100°C.

Claim 3 (original): The method according to claim 2 wherein the ionic liquid has a melting point of less than 30°C.

Claim 4 (currently amended): The method according to claim 1 ~~any preceding claim~~ wherein the ionic liquid has a vapor pressure of less than about 1 mm/Hg at 25°C.

Claim 5 (original): The method according to claim 4 wherein the ionic liquid has a vapor pressure of less than about 0.1 mm/Hg at 25°C.

Claim 6 (original): The method according to claim 5 wherein the ionic liquid has essentially no vapor pressure.

Claim 7 (currently amended): The method according to claim 1 ~~any preceding claim~~ wherein the thermal stability of the ionic liquid is ~~[[form]]~~ from 150°C to 400° C.

Claim 8 (original): The method according to claim 7 wherein the thermal stability of the ionic liquid is from 200° C to 300° C.

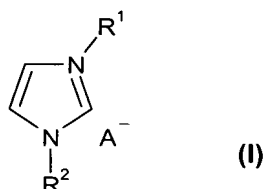
Claim 9 (currently amended): The method according to claim 1 ~~[[or 2]]~~ wherein the ionic liquid has a melting point of less than 250°C, a vapor pressure less than about 1mm/Hg at 25°C and the thermal stability of the ionic liquid is from 150° C to 400° C.

Claim 10: (currently amended): The method according to claim 1 ~~any preceding claim~~ wherein the anion of the ionic liquid is selected from the group consisting of Cl<sup>-</sup>, Br<sup>-</sup>, NO<sub>2</sub><sup>-</sup>, NO<sub>3</sub><sup>-</sup>, AlCl<sub>4</sub><sup>-</sup>, BF<sub>4</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, CF<sub>3</sub>COO<sup>-</sup>, CF<sub>3</sub>SO<sub>3</sub><sup>-</sup>, (CF<sub>3</sub>SO<sub>2</sub>)<sub>2</sub>N<sup>-</sup>, OAc<sup>-</sup>, CuCl<sub>3</sub><sup>-</sup>, GaBr<sub>4</sub><sup>-</sup>, GaCl<sub>4</sub><sup>-</sup>, and SbF<sub>6</sub><sup>-</sup>.

Claim 11 (currently amended): The method according to claim 1 ~~any preceding claim~~ wherein the cation of the ionic liquid is selected from the group consisting of pyridinium, ammonium, imidazolium, phosphonium, and sulphonium.

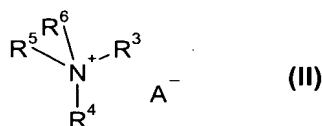
Claim 12 (currently amended): The method according to claim 1 ~~any preceding claim~~ wherein the ionic liquid is selected from the group consisting of an imidazolium salt, pyridinium salt, ammonium salt, phosphonium salt, and sulphonium salt, and mixtures thereof.

Claim 13 (original): The method according to claim 12 wherein the imidazolium salt has formula (I)



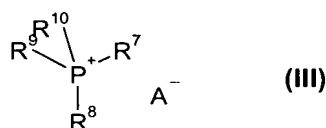
wherein R¹ and R² are independently selected from the group consisting of a C₁-C₁₈ aliphatic group and a C₄-C₁₈ aromatic group; and A⁻ is an anion.

Claim 14 (original): The method according to claim 12 wherein the ammonium salt has formula (II)



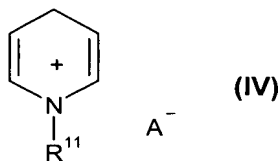
wherein R³, R⁴, R⁵ and R⁶ are independently selected from the group consisting of a C₁-C₁₈ aliphatic group and a C₄-C₁₈ aromatic group; and A⁻ is an anion.

Claim 15 (original): The method according to claim 12 wherein the phosphonium salt has formula (III)



wherein R⁷, R⁸, R⁹, and R¹⁰ are independently selected from the group consisting of a C₁-C₁₈ aliphatic group and a C₄-C₁₈ aromatic group; and A⁻ is an anion.

Claim 16 (original): The method according to claim 12 wherein the pyridinium salt has formula (IV)



wherein  $R^{11}$  is selected from the group consisting of a  $C_1$ - $C_{18}$  aliphatic group and a  $C_4$ - $C_{18}$  aromatic group; and  $A^-$  is an anion.

Claim 17 (currently amended): The method according to claim 1 ~~any preceding claim~~ wherein the ionic liquid is selected from the group consisting of 1-butyl-3-methylimidazolium hexafluorophosphate, 1-hexyl-3-methylimidazolium hexafluorophosphate, 1-octyl-3-methylimidazolium hexafluorophosphate, 1-decyl-3-methylimidazolium hexafluorophosphate, 1-dodecyl-3-methylimidazolium hexafluorophosphate, 1-ethyl-3-methylimidazolium bis((trifluoromethyl)sulphonyl)amide, 1-hexyl-3-methylimidazolium bis((trifluoromethyl)sulphonyl)amide, 1-hexylpyridinium tetrafluoroborate, 1-octylpyridinium tetrafluoroborate, 1-butyl-3-methylimidazolium tetrafluoroborate, 1-methyl-3-ethyl imidazolium chloride ~~1-methyl-3-ethyl imidazolium chloride~~, 1-ethyl-3-butyl imidazolium chloride, 1-methyl-3-butyl imidazolium chloride ~~1-methyl-3-butyl imidazolium chloride~~, 1-methyl-3-butyl imidazolium bromide ~~1-methyl-3-butyl imidazolium bromide~~, 1-methyl-3-propyl imidazolium chloride, 1-methyl-3-hexyl imidazolium chloride; 1-methyl-3-octyl imidazolium chloride, 1-methyl-3-decyl imidazolium chloride, 1-methyl-3-dodecyl imidazolium chloride, 1-methyl-3-hexadecyl imidazolium chloride, 1-methyl-3-octadecyl imidazolium chloride, 1-methyl-3-octadecyl imidazolium chloride; ~~1-methyl-3-hexyl imidazolium chloride~~; ~~1-methyl-3-octyl imidazolium chloride~~, ~~1-methyl-3-decyl imidazolium chloride~~, ~~1-methyl-3-dodecyl imidazolium chloride~~, ~~1-methyl-3-hexadecyl imidazolium chloride~~, ~~1-methyl-3-octadecyl imidazolium chloride~~, ~~1-methyl-3-octadecyl imidazolium chloride~~, ethyl pyridinium bromide, ethyl pyridinium chloride, ethylene pyridinium dibromide, ethylene pyridinium dichloride, butyl pyridinium chloride, benzyl pyridinium bromide, and mixtures thereof.

Claim 18 (original): The method according to claim 17 wherein the ionic liquid is selected from the group consisting of 1-octyl-3-methyl-imidazolium hexafluorophosphate, 1-hexyl-3-methyl-imidazolium hexafluorophosphate, 1-butyl-3-methyl-imidazolium hexafluorophosphate, 1-butyl-3-methyl-imidazolium tetrafluoroborate, 1-butyl-3-methyl-imidazolium trifluoromethanesulfonate, 1-ethyl-3-methyl-imidazolium trifluoromethanesulfonate, and 1-ethyl-3-methyl-imidazolium bis-(trifluoromethanesulfonyl)-amide.

Claim 19 (currently amended): ~~The method according to any preceding claim~~ A method to detect volatile components in a sample by headspace gas chromatography, wherein said

method comprises dissolving or dispersing a sample in at least one ionic , wherein the ionic liquid is a molten salt and volatilizing the volatile components of the sample.

Claim 20 (currently amended): ~~The method according to any preceding claim~~ A method to identify volatile components in a sample by headspace gas chromatography, wherein said method comprises dissolving or dispersing a sample in at least one ionic , wherein the ionic liquid is a molten salt and volatilizing the volatile components of the sample.

Claim 21 (currently amended): ~~The method according to any preceding claim~~ A method to quantify volatile components in a sample by headspace gas chromatography, wherein said method comprises dissolving or dispersing a sample in at least one ionic liquid, wherein the ionic liquid is a molten salt and volatilizing the volatile components of the sample.

Claim 22 (currently amended): The method according to claim 1 ~~any preceding claim~~ wherein the sample is a pharmaceutical compound.

Claim 23 (currently amended): ~~The method according to any preceding claim~~ A method to detect impurities in a pharmaceutical compound by headspace gas chromatography, wherein said method comprises dissolving or dispersing a pharmaceutical compound in at least one ionic liquid, wherein the ionic liquid is a molten salt and volatilizing the volatile components of the pharmaceutical compound.